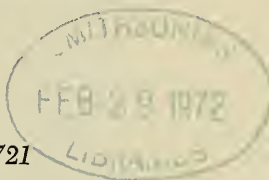


PROCEEDINGS
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A SUBSPECIES OF *AGKISTRODON BILINEATUS*
(SERPENTES: CROTALIDAE) ON THE YUCATÁN
PENINSULA, MÉXICO

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Study of the snake species *Agkistrodon bilineatus* has proved to be unexpectedly difficult because of the nature of available material. Although I have examined some 130 specimens, 39 percent of them are without definite localities or are young born in zoos with no indication of provenance. Many to which localities are attached are mangled or injured in such ways as to make accurate scale counts or measurements impossible. No single locality is represented by a series sufficiently large for an indication of local variation, except possibly Colima, and some specimens listed from there are questionable.

First described by Günther (1863) from the Pacific Coast of Guatemala, *Agkistrodon bilineatus* was recorded from Yucatán by this same author (1895), and subsequently from there by Gaige (1936), Schmidt and Andrews (1936), and Duellman (1965a). Through the courtesy of Dr. William E. Duellman and of Dr. T. Paul Maslin I have had the privilege of studying some well-preserved specimens recently obtained in Yucatán and Campeche, and have been led to the conclusion that this peninsular population represents a subspecies that should be recognized by name. I therefore propose that it be known as:

***Agkistrodon bilineatus russeolus* new subspecies**
Yucatecan Cantil

Ancistrodon bilineatus, Günther, 1895, p. 186 (part).—Velasco, 1895, p. 37.—Boulenger, 1896, p. 521-522 (part).

Agkistrodon bilineatus, Gaige, 1936, p. 303.—Schmidt and Andrews, 1936, p. 181.—Gloyd and Conant, 1943, p. 163 (part).—Smith and Taylor, 1945, p. 177 (part).

Agkistrodon bilineatus bilineatus, Duellman, 1965a, p. 611.

Holotype: University of Kansas, Museum of Natural History (KU) No. 70905, male, collected 20 July 1962 by Jerome B. Tulecke, 11.7 km. north of Pisté, Yucatán, México.

Paratypes: KU 70904, male, Pisté, Yucatán, 21 July 1962, Erwin E. Klaas; KU 70903, female, 5 km. south of Champotón, Campeche, William C. Stanley; University of Colorado Museum (UCM) 40640 and 40641, females, UCM 41792, male, Pisté, Yucatán, Eduardo Welling; University of Michigan, Museum of Zoology (UMMZ) 73056, female, Motul, Yucatán; UMMZ 83934, female, Chichén Itzá, Yucatán; Field Museum of Natural History (FMNH) 19425, female, Mérida, Yucatán; FMNH 36253, female, Libre Unión, Yucatán.

Diagnosis: From *A. b. bilineatus* this subspecies is distinguished by the following attributes: the presence of conspicuous light areas of ground color between crossbands; cheek stripe, bases of crossbands and ventrolateral spots dark chestnut brown, broadly edged with white, the white extending onto ventral scutes; belly light along midline and with numerous white markings irregularly distributed; light lines on sides of head relatively narrow, the upper especially so, the lower extending across the centers of the supralabials anteriorly then descending to their lower margins posteriorly. The white does not extend over the greater part of the supralabials as in *A. b. taylori*. From *A. b. taylori* this form is distinguished by the narrow light line on the supralabials bordered by dark below, and by the higher number of subcaudals.

Description of holotype: Crown with the nine symmetrical plates characteristic of the genus, unmodified in shape. Rostral slightly higher than wide, apex not rising above canthus. Nasals 2, the anterior at upper edge about $1\frac{1}{2}$ times the width of the posterior one. Preoculars 2, the upper separated from the postnasal by a quadrangular loreal, wider at the base; the lower preocular forming the upper posterior border of the pit; a small postfoveal below. Post- and suboculars 3 on the left side, 5 on the right. Orbit surrounded by 7 scales on left, 8 on right (including postfoveals). Supralabials 8, the upper portion of the second forming the anterior border of the pit, which is bordered below by a rectangular subfoveal. Infralabials 12 on left, 11 on right. Temporals in irregular rows, the anteriormost of the lowest row conspicuously larger than all the others; first and second rows of temporals without keels. First pair of infralabials extending backward in long, narrow points that are in contact with each other posterior to tip of mental. One pair of enlarged chin shields, each about twice as long as wide. Median gulars in 3 pairs; lateral gulars in 3 to 5 oblique rows.

Dorsal scales with paired apical pits; all with keels except those of

lowermost row anteriorly. Scale rows 25-23-21-19, order of reduction irregular (Dowling recount system, 1951):

$$25 \frac{-4 (44)}{4 + 5 (31)} \quad 23 \frac{-5 (93)}{4 + 5 (85)} \quad 21 \frac{-5 (118)}{-5 (117)} \quad 19 (137)$$

Ventrals 137; anal not divided; hemipenes everted. Subcaudals .62, the 28th to 30th and the distal 31 divided; terminal spine sharp, decurved. No conspicuous injuries or anomalies.

Total length 850 mm; length of tail 155 mm, 18.2 percent of total length.

General coloration, in alcohol, varying tones and shades of brown. Crown and sides of head deep reddish brown. A broad, dark reddish-brown cheek stripe bordered by narrow light lines above and below; the upper line shows traces of yellow, begins on the tip of the internasal, extends along the edges of the internasal, supraocular, uppermost post-ocular, and diagonally backward on the second row of temporals and downward to the neck; the lower light line extends obliquely downward on the anterior nasal and first supralabial, and backward on the middle of supralabials 2 and 3 and then across supralabials 4 to 8 to the commissure, and downward as a series of spots on the lateral gulars. The rostral and mental are each marked medially with a conspicuous vertical light bar.

The dorsal ground color, which appears in the pale areas between the crossbands dorsally and down the sides, is light brown. The 15-16 reddish-brown crossbands are darker at their edges and incompletely bordered by white spots which are larger and more conspicuous on the sides. The chestnut brown ventrolateral blotches are broadly connected with the crossbands on the sides and merge below with the dark grayish brown on the venter; they also are broadly but incompletely edged with white. The ventral ground color is grayish brown, lighter along the middle of the belly. On the tail there are 10 or 12 dark crossbands that become pale where the distal half of the tail is light yellowish gray.

Paratypes: In these nine specimens, five adults and four juveniles, the diagnostic characters of pattern and coloration are consistently present. The three KU specimens (including the holotype) and the three UCM specimens were collected more recently than the others and have color tones much better preserved. KU 70903 and 70904 resemble the type specimen in general but are somewhat darker. The cheek stripes, crossbands, and ventrolateral spots are dark chestnut brown or grayish brown, with a suggestion of red. The light areas dorsally between the bands are pale tan with a slight tinge of pink. The ventral ground color is dark chocolate brown, conspicuously lighter medially. The white markings at the edges of the crossbands are narrow and interrupted dorsally, broad and conspicuous ventrolaterally. UCM 40641 resembles KU 70904 in general coloration; UCM 40640 and 41792 are notably darker than other subadults examined; 41792 has a strikingly ornate pattern, the

crossbands in strong contrast with the pale brown ground color and the white markings notably conspicuous.

Three slight aberrations occur in KU 70903: there is a small azygous scale at the anterior midpoint of the frontal; the loreals are apparently absent (the postnasals are in contact with the upper preoculars); and the parietals are separated posteriorly by a triangular scale. FMNH 36253 also has a median azygous scale just anterior to the frontal.

Other characters of the two males and seven females of the paratype series may be summarized as follows. Scale rows 25-23-19 (17 in one); ventrals, males, 131, 137, females 135-138 (136.8); subcaudals, males, 61, 53+ (tip missing), females, 49-61 (54.4); divided subcaudals, males, 30, 30+, females, 21-38 (31.8); supralabials 8-8; infralabials 10-12 (10.8), 8 in one case, an aberration; post- and suboculars 4-4 (4-3 in one); loreals 1-1; crossbands of body 13-17 (indistinct in some specimens); crossbands of tail, when visible, about 10. Total length of males 450, 1050+ mm (tail incomplete); of adult females 945, 985, 995, 1010 mm; of juvenile females 282, 300, 315 mm. Tail length in percent of total, one male 19.5; adult females 15.0-16.2 (15.7), juveniles 19.0-20.0 (19.5).

The Mayan name for this snake is *wolpoch* (Gaige, 1936) or *Uol-poch* (Schmidt and Andrews, 1936).

The subspecific name *russeolus* refers to the somewhat reddish tinge in the coloration of the more recent specimens. Although the vernacular name cantil appears to be most commonly applied to *A. bilineatus* on the west coast of Mexico, it has been generally accepted as an English name for the species. It therefore seems logical to suggest Yucatecan Cantil for the peninsular subspecies.

Geographical distribution: Yucatán Peninsula of Mexico: States of Campeche and Yucatán.

KEY TO THE SUBSPECIES OF *AGKISTRODON BILINEATUS*

- 1a. Subcaudals 50-56 in males, 47 in (2) females; lower light line on side of head covering lower halves of supralabials, not bordered by dark below; crossbands of body more or less distinct in adults as well as juveniles — *taylori* Burger and Robertson, 1951. Eastern Mexico: Semi-arid areas in southern Nuevo León and Tamaulipas (Martin, 1958).
 - 1b. Subcaudals 58-68 in males, 49-62 in females; lower light line on side of head crossing supralabials above commissure, bordered by dark below 2
 - 2a. Conspicuous light areas separating crossbands dorsally; main pattern dark chestnut brown; white markings at edges of crossbands and ventrolateral spots notably broad and ornate; venter lighter along midline and with numerous white markings *russeolus* new subspecies.
- Mexico: Yucatán Peninsula—Campeche and Yucatán. The species was reported from Campeche by Velasco (1895).

- 2b. Dorsal ground color between crossbands dark, little if any different from that of bands; main pattern dark gray or brownish black; white markings mostly narrow, less conspicuous; venter generally dark, white markings few -----

bilineatus Günther, 1893.

Pacific side of Central America and Mexico, from Costa Rica (Bolaños and Montero, 1970), Nicaragua (Villa, 1962) and El Salvador (Mertens, 1952a, b) to southern Sonora (Bogert and Oliver, 1945). I have examined specimens from Guatemala and from the States of Chiapas, Oaxaca, Guerrero, Morelos, Michoacán, Colima, Jalisco, Nayarit, Sinaloa, and Sonora, Mexico.

The Tres Mariás Islands, off Nayarit, are represented by two specimens of *A. bilineatus* in the British Museum, collected [probably on María Madre] by A. Forrer in 1881 (Boulenger, 1896, p. 522), and one from María Madre in the National Museum of Natural History collected by Nelson and Goldman in 1897. Possible differences in coloration of these specimens from those of the mainland population are obscured by ageing. One of the two males (USNM 24685) has a deceptively low number of subcaudals (21 + 25, Stejneger, 1899, p. 71). Although the tip is pointed and bears what may be mistaken for a terminal spine, the tail is probably incomplete. If the species still exists on María Madre, fresh material would be of considerable interest.

A specimen in the British Museum (Boulenger, 1896, p. 522, "b") and another in the Field Museum (FMNH 4196) are listed as from "Belize." According to Allen and Neill (1959, p. 227), Belize was a 19th Century name for a vaguely defined area before it became officially known as British Honduras. Various other authors have assumed, perhaps erroneously, that the present capital city of that name was indicated. On the basis of uncertainty of the provenance of these two specimens, and on topographical and ecological considerations, these authors have properly questioned the natural occurrence of the species in that region.

Ecological data for *Agkistrodon bilineatus* are scanty throughout its range, but from what is now known of its occurrence in both eastern and western Mexico it appears not to be confined to riparian habitats. Although frequently mentioned in the literature as found along streams and in other moist places, it is now known to occur in less humid areas. The KU specimens of *A. b. russeolus* from Yucatán were collected at night in deciduous scrub forest (Duellman, 1965a); the known specimens of *A. b. taylori* are reported from semi-arid areas in Tamaulipas (Burger and Robertson, 1951; Martin, 1958). As to *A. b. bilineatus*, the example from Sonsonate, El Salvador (Mertens, 1952b) appears to have been taken in lowland dry forest; specimens reported from Michoacán (Duellman, 1961, 1965b) and from Sinaloa (Hardy and McDiarmid, 1969) are from semi-arid regions; the individual recently reported from Costa Rica, 25 km northwest of Liberia, Guanacaste Province (Bolaños

and Montero, 1970), was taken during the dry season on rocky terrain in "Tropical Dry Forest, Moist Province Transition."

In a personal communication, Roger Conant has remarked that during the enormous amount of time he has spent in exploring riparian habitats at night in many parts of Mexico, primarily in quest of water snakes of the genus *Natrix*, he never once encountered *Agkistrodon bilineatus* in the field. A more detailed treatment of the distribution and ecology of this species is reserved for a later contribution on the genus as a whole.

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